## AMENDMENTS TO THE CLAIMS:

This listing of claims will replace prior versions and listings of claims in the application.

## Listing of claims:

Claims 1, 5-9, 13-15 have been amended, and claims 2-4 and 10-12 have been withdrawn as follows: Underlines indicate insertions and ~~strikeouts~~ indicate deletions.

1. (Currently amended) A method for ~~the~~ extraction of linear features from digital imagery, comprising the steps of:

providing a digital image;

providing a multi-layer database;

initializing a parameter domain;

successively applying ~~the~~ a Radon transform on each position in the parameter domain;

for each position in the parameter domain:

finding ~~the~~ coordinates of ~~the~~ a nearest pixel in the digital image;

determining ~~the~~ a numerical value of the ~~found~~ nearest pixel; and

populating ~~the~~ layers of the ~~provided~~ multi-layer database in accordance with the ~~determined~~ numerical value of the ~~found~~ nearest pixel;

analysing ~~the~~ data of the multi-layer database for linear features; and

generating an output image by restoring the ~~lines~~ detected linear features ~~in the analysing step~~.;

wherein said step of providing a multi-layer database includes providing a multi-layer database having at least five layers: a first layer used to contain coordinates of zero value pixels; a second layer used to contain coordinates of non-zero value pixels; a third layer used to contain values of the non-zero value pixels; a

fourth layer used to contain ~~the~~ values of the zero value pixels, and a fifth layer used to contain an accumulation of the non-zero pixel values.

2.  (Withdrawn) ~~A method for the extraction of linear features as recited in claim 1, wherein the multi-layer database providing step includes providing a multi-layer database having at least three layers; a first layer used to contain the coordinates of the zero value pixels; a second layer used to contain the coordinates of the non-zero value pixels and a third layer used to contain the values of the non-zero value pixels.~~

3.  (Withdrawn) ~~A method for the extraction of linear features as recited in claim 2, wherein, in said populating step:~~
~~the coordinates of the found pixel are stored in the first layer when the numerical value of the pixel is found to be zero;~~
~~the coordinates of the found pixel are stored in the second layer when the numerical value of the pixel is found to be non-zero;~~
~~the numerical value of the non-zero pixels is stored in the third layer.~~

4.  (Withdrawn) ~~A method for the extraction of linear features as recited in claim 1, wherein the multi-layer database providing step includes providing a multi-layer database having at least five layers; a first layer used to contain the coordinates of the zero value pixels; a second layer used to contain the coordinates of the non-zero value pixels; a third layer used to contain the values of the non-zero value pixels; a fourth layer used to contain the values of the zero value pixels and a fifth layer used to contain the accumulation of the non-zero pixel values.~~

5.  (Currently amended) ~~A~~ <u>The</u> method for the extraction of linear features as recited in claim ~~4~~ <u>1</u>, wherein, ~~in~~ said <u>step of</u> populating ~~step~~ <u>the layers of the multi-layer database comprises</u>:
<u>storing</u> the coordinates of the ~~found~~ <u>nearest</u> pixel ~~are stored~~ in the first layer when the numerical value of the <u>nearest</u> pixel is found to be below a predetermined threshold;

storing the coordinates of the ~~found~~ nearest pixel ~~are stored~~ in the second layer when the numerical value of the nearest pixel is found to be above the predetermined threshold;

storing ~~the~~ a numerical value of ~~the~~ pixels having a value which is above the predetermined threshold ~~is stored~~ in the third layer;

storing ~~the~~ a numerical value of ~~the~~ pixels having a value which is below the predetermined threshold ~~is stored~~ in the fourth layer; and

storing ~~the~~ an accumulation of the numerical value of ~~the~~ pixels that have a numerical value which is above the predetermined threshold ~~is stored~~ in the fifth layer.

6.    (Currently amended) A The method for the extraction of linear features as recited in claim 1, wherein said ~~data analysing~~ step of analysing the data of the multi-layer database includes the substep of finding ~~the~~ endpoints of each linear feature to be extracted.

7.    (Currently amended) A The method for the extraction of linear features as recited in claim 6, further comprising the step of storing the endpoints found in a database ~~which is~~ used in ~~the output image generating~~ said step of generating the output image.

8.    (Currently amended) A The method for the extraction of linear features as recited in claim 1, further comprising the step of providing ~~the~~ a minimum and a maximum length of the ~~lines~~ linear features to be detected.

9. (Currently amended) A system for ~~the~~ extraction of linear features from a digital image and for generating a corresponding output image, comprising:

a controller provided with an input designed to receive a digital image and an output designed to provide a corresponding output image; said controller containing a multi-layer database; said controller being so configured as to:

initialize ~~the~~ a discrete parameter domain;

successively apply a Radon transform on each position in the parameter domain;

for each position in the parameter domain:

find ~~the~~ coordinates of ~~the~~ a nearest pixel in the digital image;

determine ~~the~~ a numerical value of the ~~found~~ nearest pixel; and

populate ~~the~~ layers of the ~~provided~~ multi-layer database in accordance with the ~~determined~~ numerical value of the ~~found~~ nearest pixel;

analyse ~~the~~ data of the multi-layer database to detect linear features;

and

generate an output image by restoring the ~~lines~~ detected linear features ~~in the analysing step.~~;

wherein the multi-layer database includes at least five layers: a first layer used to contain coordinates of zero value pixels; a second layer used to contain coordinates of non-zero value pixels; a third layer used to contain values of the non-zero value pixels; a fourth layer used to contain values of the zero value pixels, and a fifth layer used to contain an accumulation of the non-zero pixel values.

10. (Withdrawn) ~~A system for the extraction of linear features as recited in claim 9, wherein the multi-layer database includes at least three layers; a first layer used to contain the coordinates of the zero value pixels; a second layer used to contain the coordinates of the non-zero value pixels and a third layer used to contain the values of the non-zero value pixels.~~

11. (Withdrawn) ~~A system for the extraction of linear features as recited in claim 10, wherein, when populating the database, the controller is so configured as to:~~

~~store the coordinates of the found pixel in the first layer when the numerical value of the pixel is found to be zero;~~

~~store the coordinates of the found pixel in the second layer when the numerical value of the pixel is found to be non-zero;~~

~~store the numerical value of the non-zero pixels in the third layer.~~

12. (Withdrawn) ~~A system for the extraction of linear features as recited in claim 9, wherein the multi-layer database includes at least five layers; a first layer used to contain the coordinates of the zero value pixels; a second layer~~

~~used to contain the coordinates of the non-zero value pixels; a third layer used to contain the values of the non-zero value pixels; a fourth layer used to contain the values of the zero value pixels and a fifth layer used to contain the accumulation of the non-zero pixel values.~~

13.   (Currently amended) A The system for the extraction of linear features as recited in claim 9 ~~12~~, wherein, when populating the layers of the multi-layer database, the controller is so configured as to:

store the coordinates of the ~~found~~ nearest pixel in the first layer when the numerical value of the nearest pixel is found to be below a predetermined threshold;

store the coordinates of the ~~found~~ nearest pixel in the second layer when the numerical value of the nearest pixel is found to be above the predetermined threshold;

store ~~the~~ a numerical value of ~~the~~ pixels having a value which is above the predetermined threshold in the third layer;

store ~~the~~ a numerical value of ~~the~~ pixels having a value which is below the predetermined threshold in the fourth layer; and

store ~~the~~ an accumulation of the numerical value of the pixels that have a numerical value which is above the predetermined threshold in the fifth layer.

14.   (Currently amended) A The system for the extraction of linear features as recited in claim 9, further comprising an output device connected to said output of said controller to receive the output image generated by said controller.

15.   (Currently amended) A The system for the extraction of linear features as recited in claim 9, further comprising an input device connected to said input of said controller to supply the digital image to the controller.